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Illness Perceptions in Patients With Fibromyalgia and Their Relationship to Quality of Life and Catastrophizing

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Objective. **In the last decade, illness perceptions have been identified as important in the treatment of fibromyalgia (FM). The aim of the present study was to examine illness perceptions and use of the revised Illness Perception Questionnaire in patients with FM (IPQ-R-FM) and their relationship to quality of life and catastrophizing.**

Methods. **A domain with specific causal attributions related to FM was added to the IPQ-R-FM. The psychometric properties of the IPQ-R-FM dimensions and attribution scales were examined. The causal domain, in which patients describe the most important perceived causes for their FM, was analyzed. To analyze the relationship with quality of life and catastrophizing, the Fibromyalgia Impact Questionnaire and the Pain Catastrophizing Scale were used.**

Results. **Fifty-one outpatients completed the questionnaires on 2 occasions, 3 weeks apart. FM was considered to be chronic and to have serious consequences; patients perceived little personal control and did not expect medical treatment to be effective. The psychometric properties of the IPQ-R-FM were found to be adequate. Patients most frequently attributed the causes of FM to an external somatic source (58%). Quality of life was related to experiencing more consequences attributable to FM. Catastrophizing was related to a limited understanding of the symptoms of FM, the more cyclical nature of FM, and an emotional representation.**

Conclusion. **The IPQ-R-FM is a useful tool to assess illness perceptions in patients with FM. Illness perceptions are related to quality of life and catastrophizing; therefore, it seems important to assess and integrate illness perceptions into the management of patients with FM.**

The diagnosis of fibromyalgia (FM) relies on symptom criteria, including widespread pain characterized by multiple tender points. Other symptoms frequently reported are fatigue, stiffness, depression, abdominal pain, and disturbed sleep (1). FM is a chronic pain syndrome, the pathogenesis of which is unknown but seems to depend on multiple factors that differ among individual patients. These factors may consist of physical, psychological, behavioral, cognitive, and environmental components. The recommended treatment, therefore, is characterized by a multimodal approach, including pharmacotherapy and self-management (2,3). Self-management programs for patients with FM incorporate combinations of several treatment strategies such as exercise (4), education (5), and stress management (6). Education (7) and psychoeducational interventions (8) have been described as effective in the treatment of patients with FM. Education aims at changing the inadequate cognitions of patients.

In the last decade, cognitions and illness perceptions have been identified as important in the ability to control musculoskeletal conditions such as FM. In both cross-sectional and prospective studies across different musculoskeletal conditions, catastrophizing has been shown to be related to the severity of pain, affective distress, muscle and joint tenderness, pain-related disability, poor treatment outcomes, and potentially to inflammatory disease (9–11). The Pain Catastrophizing Scale (PCS) is used to identify catastrophizing in patients with pain (12).

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When patients are confronted with an illness or with symptoms, as in FM, they create a model and representation of this illness or symptoms (illness perceptions) in order to make sense of or try to cope with the illness and its symptoms. Each patient will have his or her own ideas about the identity, treatment, timeline, and consequences of the illness or symptoms. In this process, attributions are made in order to understand the cause of the symptoms (e.g., a psychological attribution such as stress or a physical attribution such as rheumatism). Leventhal et al developed the self-regulation model (as a theoretical framework for combining illness perceptions with coping and outcome; i.e., quality of life) (13). In order to assess illness perceptions, Weinman et al developed the Illness Perception Questionnaire (IPQ) (14). This IPQ was later modified by Moss-Morris et al into the revised IPQ (IPQ-R) (15). The IPQ-R measures perceptions and attributions of patients. It has been tested in different patient groups such as those with Huntington's disease (16), mild head injuries (17), coronary artery disease (18), or head and neck cancer (19). Stuifbergen et al used the IPQ-R in patients with FM (20). In a cross-sectional study, those investigators examined the links between illness perceptions, mental health, and health behavior and determined that the emotional representations of patients with FM explained 41% of the variance of mental health and 17% of health-related behavior.

Although illness perceptions have been shown to be important, the integration of illness perceptions into the clinical assessment and management of patients with FM needs further elaboration and research. The psychometric properties of the IPQ-R should be tested further, and research should focus on the specific illness perceptions of patients with FM. The Fibromyalgia Impact Questionnaire (FIQ) can be used to investigate the link between the illness perceptions of patients with FM and quality of life. It was demonstrated to be an efficient questionnaire to evaluate the impact of FM on quality of life (21).

The aims of the present study were to investigate the illness perceptions of patients with FM, to analyze the psychometric properties (interclass correlation, test–retest reliability, and interrelationships), and to examine the links between illness perceptions, quality of life (using the FIQ), and catastrophizing (using the PCS).

PATIENTS AND METHODS

Patients were recruited from the Dutch FM patient association (Fibromyalgie Eendrachtig Sterk [FES]) by means of an announcement on the FES Web site. If a patient expressed willingness to participate, he or she was asked, through the Web site, to send an e-mail or letter to the investigators. The patients then received additional information concerning the study and a set of questionnaires (T1). Three weeks after the patients filled out the questionnaires, they received a second set of the same questionnaires (T2). All patients were required to have FM according to the criteria described by Wolfe et al (1), as diagnosed by a rheumatologist or general practitioner, and to be experiencing pain, stiffness, and fatigue at the moment of the study. Due to the test–retest arrangement, patients were asked not to receive any new treatment during the study period that could interfere with their cognitions or attributions regarding FM.

The following sociodemographic and clinical data were collected in the questionnaire: age, sex, number of painful body sites (minimum = 0, maximum = 28), duration of pain, time since the diagnosis of FM, pain intensity (numerical rating scale [NRS], possible range 1–10), and medication use. The IPQ-R was used to measure illness perceptions, and its psychometric properties are accurate (14). The IPQ-R can be used in different patient groups by adapting the questionnaire to that specific patient group. In our study, the original IPQ-R was translated into Dutch, and the terminology "my illness" was changed into "my fibromyalgia"; the adapted questionnaire was labeled "IPQ-R-FM (Dutch language version)."

In the dimension of illness termed "identity," patients were asked if they experienced a specific symptom (based on a total of 14 possible symptoms) and whether they believed the symptom was related to their FM. In the next section, patients were asked to indicate their level of agreement (on a 5-point scale, where 1 = strongly disagree and 5 = strongly agree) with statements concerning an acute/chronic timeline (5 items about the chronicity of FM), a cyclical timeline (4 items about the cyclical nature of FM), the consequences of FM (6 items about the negative consequences of FM), personal control (6 items representing positive beliefs about personal controllability), treatment control (5 items representing positive beliefs about the treatment ability), illness coherence (5 items about the personal understanding of FM), and emotional representation (6 items about emotions caused by FM). The causal domain is presented as a separate section; it consists of 18 attribution items that can be divided into the following 4 subdimensions: psychological attributions such as personality, stress, or worry (6 items), risk factors such as heredity and smoking (7 items), immunity factors such as germs or viruses (3 items), and accident or chance (2 items). The causal domain of the IPQ-R can be used for any disease.

Because patients with FM have specific beliefs regarding the cause of their symptoms, an FM-specific dimension was added to the IPQ-R-FM that included 8 FM-specific causes, namely, rheumatism, muscular disease, a psychological trauma in the past, hormonal deregulation, decreased vascularization, overused tendomuscular junctions, sleeping problems, and thyroid gland disease. These causes were based on the clinical experience of the authors with patients with FM. For scoring the IPQ-R-FM, we referred to the approach described by Moss-Morris et al (15). The FM-specific causes are summed (minimum 8, maximum 40). At the end of the IPQ-R-FM, patients are asked to mention in their own words a maximum of 3 causes for their FM. To analyze these causes, an attribu-

tion model was adopted that contains the categories of psychological or somatic cause and internal or external attribution. The model resulted in the following 5 options: psychological cause/internal attribution, psychological cause/external attribution, somatic cause/internal attribution, somatic cause/external attribution, and cause not classifiable.

To analyze the link between illness perception and quality of life and catastrophizing, the FIQ and the PCS were used. The FIQ is a self-administrated questionnaire with 10 items that include 4 subscales: physical impairment (11 subitems), number of days feeling good (range 0–7), number of days unable to work (range 0–7), and 6 symptoms (pain, fatigue, morning tiredness, stiffness, anxiety, and depression) (score range 1–10) (22). The questionnaire has credible construct validity, reliable test–retest characteristics, and good sensitivity for therapeutic changes (23). The FIQ is frequently used in studies of FM and is the most adequate method to analyze quality of life in patients with FM (21). In this study, the symptoms (pain, fatigue, morning tiredness, stiffness, anxiety, and depression) and the total score for the FIQ are used to analyze the link between symptoms and quality of life with the IPQ dimensions and attribution scales.

The PCS is a 13-item questionnaire in which patients are asked to reflect on past painful experiences and indicate the degree to which they experienced thoughts or feelings during pain, on a 5-point scale. For this study, the total score for the PCS was used. The psychometric properties of the PCS are adequate (12,24).

All data were entered using SPSS version 14.0 (SPSS, Chicago, IL). Descriptive statistics were used to describe the sociodemographic data and history of pain. The internal consistency (Cronbach's alpha) for each dimension and attribution was analyzed. Test–retest reliability over a 3-week interval was calculated using Pearson's correlations between the 2 time points. Pearson's correlation coefficients were computed to investigate the interrelationships of the dimensions of the IPQ-R-FM and the attributions. The causes described by the patients were classified separately by 2 investigators. In case of discrepancies, the differences were discussed until agreement was reached. To analyze the link between the IPQ dimensions and quality of life and catastrophizing, Pearson's correlations between the dimension and attribution scales of the IPQ with the symptoms and total score of the FIQ and the PCS were calculated.

RESULTS

Of the 58 patients included in the study, 51 were analyzed. Six patients withdrew from the study, either because they did not return the questionnaires (n = 2) or because they returned the questionnaires too late (n = 3). One patient received a new treatment during the study period and was therefore excluded. The majority of the patients (92%) were female, which is consistent with population characteristics of patients with FM. Patients experienced pain for ~10 years, and the mean duration of time before receiving a diagnosis of FM was 5 years. Patients experienced severe pain, as evidenced by their mean ± SD NRS score of 7.1 ± 1.8. Most patients took analgesics for their FM, and, although this is not recommended, nonsteroidal antiinflammatory drugs and acetaminophen were taken on a large scale (Table 1).

Table 1. Demographic data, marital status, education, socioeconomic status, clinical characteristics, and use of pain medication in the 51 patients with FM*

Age, mean ± SD years	44 ± 10
Female sex/male sex	47/4 (92/8)
Marital status	
Married/cohabiting	35 (68)
Divorced	5 (10)
Single	11 (22)
Education	
Elementary/middle school	8 (16)
High school	24 (47)
College/university	19 (37)
Socioeconomic status	
Employed	29 (57)
Unemployed	8 (16)
Disability pension/sick leave	12 (24)
Student	2 (4)
Stiffness, mean ± SD NRS score (scale 1–10)	7.3 ± 2.2
Fatigue, mean ± SD NRS score (scale 1–10)	7.9 ± 1.6
Pain intensity, mean ± SD NRS score (scale 1–10)	7.1 ± 1.8
Duration of pain/time since diagnosis of FM, mean years	10.1/5.2
No. of pain sites, mean ± SD (possible range 0–28)	14.8 ± 5.9
Pain medication	
NSAIDs, including acetaminophen	37 (73)
NSAIDs plus benzodiazepines	1 (2)
Benzodiazepines or TCAs	1 (2)
Opioids plus benzodiazepines and/or TCAs	7 (14)
Opioids plus NSAIDs	3 (6)
No medication	2 (4)
Pain medication frequency	
>3 times daily	16 (31)
1–2 times daily	9 (18)
2–6 times weekly	15 (30)
≤1 time weekly	11 (22)

* Except where indicated otherwise, values are the number (%) of patients. FM = fibromyalgia; NRS = numerical rating scale; NSAIDs = nonsteroidal antiinflammatory drugs; TCAs = tricyclic antidepressants.

Patients experienced a mean ± SD of 7.7 ± 2.2 symptoms at T1 and 7.4 ± 2.0 symptoms at T2. Of the symptoms experienced, 5.5 ± 2.4 at T1 and 5.6 ± 2.2 at T2 were perceived to be related to FM. Pain, fatigue, and loss of strength were the most common symptoms experienced by the patients, and these symptoms were perceived as related to the FM (Table 2).

The dimensions of the IPQ-R-FM are shown in Table 3. Patients perceived FM to be chronic with serious consequences and perceived little personal control and little treatment control. The internal consistency of the IPQ-R-FM is adequate ($\alpha > 0.70$) for 5 dimensions and attributions. No relationship between the 2

Table 2. Identity scale scores for 14 commonly experienced symptoms*

Symptom	I have experienced these symptoms since my diagnosis of FM	I have experienced these symptoms as related to my FM
Pain	98/94	96/100
Fatigue	98/92	92/98
Loss of strength	92/85	85/93
Sleep difficulties	83/79	88/83
Stiff joints	79/87	85/89
Upset stomach	64/69	48/56
Headaches	62/58	47/57
Sore eyes	60/58	42/43
Dizziness	50/39	46/60
Nausea	27/21	43/55
Breathlessness	23/27	25/21
Sore throat	19/10	30/20
Wheezing	13/8	29/0
Weight loss	2/2	100/100

* Values are the percent of 51 patients who responded "yes" on the first/second revised Illness Perception Questionnaires. FM = fibromyalgia.

items for chance attribution was observed. Test–retest reliability was analyzed over a period of 3 weeks. Pearson's correlations between the dimensions at T1 and T2 showed overall good stability, despite some low correlations for identity (0.24), personal control (0.57), and illness coherence (0.55).

Several significant correlations among the scores for the IPQ-R dimensions and attributions were observed (Table 4). Treatment control and personal control were strongly correlated. Low illness coherence means little personal understanding of the symptoms and causes of FM; this limited personal understanding is strongly related to an emotional representation. Patients with more psychological attributions for their FM, such as stress or "my emotional state," had more risk factor attributions such as eating habits or heredity (Table 4). The FM-specific attributions were significantly related to the psychological attributions and risk factor attributions. The attributions most frequently reported for the cause of FM were overused tendomuscular junctions (3.6 and 3.7 at T1 and T2, respectively), rheumatism (3.5 and 3.5, respectively), sleeping disturbances (3.2 and 3.0, respectively), stress or worry (3.1 and 3.1, respectively), chance or bad luck (3.1 and 3.1, respectively), and altered immunity (3.1 and 2.9, respectively). These 6 causes were reported most often both at T1 and T2.

The last question on the IPQ-R-FM provided patients with the opportunity to list a maximum of 3 causes for their FM. Patients reported a mean of 2.6 causes at T1 and a mean of 2.7 causes at T2. A somatic cause was most frequently mentioned (in 64% of cases). The causes most frequently reported were muscular disease, vulnerability, and genetics. In 90% of cases, these somatic causes had an external attribution such as heredity or bad luck; in 10% of cases, these somatic causes had an internal attribution such as working overtime or not getting enough rest. Psychological causes were mentioned in 31% of the cases, with an external attribution in 35% and an internal attribution in 65% of these cases. Most of the psychological causes reported were stress, perfectionism, or a psychologically

Table 3. Scores, internal consistency, and 3-week test–retest reliability of the IPQ-R-FM dimensions and attributions*

	Score, mean ± SD	Cronbach's alpha for internal consistency	Test–retest reliability, by Pearson's correlation
Dimension (no. of items)			
Identity (14)	5.5 ± 2.4		0.24
Timeline, acute/chronic (6)	25.4 ± 3.9	0.80	0.69†
Consequences (6)	19.3 ± 4.1	0.64	0.75†
Personal control (6)	19.5 ± 4.2	0.83	0.57†
Treatment control (5)	15.7 ± 3.2	0.67	0.72†
Illness coherence (5)	15.9 ± 3.4	0.51	0.55†
Cyclical timeline (4)	15.0 ± 3.3	0.77	0.77†
Emotional representation (6)	16.2 ± 5.1	0.86	0.72†
Attribution (no. of items)			
Psychological attribution (6)	14.7 ± 5.8	0.90	0.85†
Risk factor attribution (7)	15.1 ± 3.6	0.48	0.69†
Immune attribution (3)	7.4 ± 2.0	0.47	0.73†
Chance attribution (2)	5.5 ± 1.7	0.00	0.62†
FM-specific attribution (8)	23.5 ± 4.7	0.61	0.65†

* IPQ-R-FM = revised Illness Perception Questionnaire in patients with fibromyalgia (FM).
† $P = 0.01$.

Table 4. Pearson's correlations between IPQ-R-FM dimensions and attributions about the cause of FM in 51 patients*

	Dimension or attribution											
	1	2	3	4	5	6	7	8	9	10	11	12
Dimension (no. of items)												
1. Identity (14)												
2. Timeline, acute/chronic (6)	0.16											
3. Consequences (6)	0.20	0.12										
4. Personal control (6)	−0.14	−0.31†	−0.21									
5. Treatment control (5)	−0.10	−0.34†	−0.22	0.73‡								
6. Illness coherence (5)	−0.29†	−0.07	−0.18	0.20	0.18							
7. Cyclical timeline (4)	0.36†	0.17	0.08	−0.13	−0.16	−0.29†						
8. Emotional representation (6)	−0.05	0.06	0.28†	−0.25	−0.25	−0.49‡	0.13					
Attribution (no. of items)												
9. Psychological attribution (6)	−0.11	0.02	0.24	0.11	0.16	−0.15	−0.10	0.27				
10. Risk factor attribution (7)	−0.24	−0.09	0.09	0.23	0.15	−0.13	0.01	0.11	0.58‡			
11. Immune attribution (3)	0.08	−0.17	−0.07	−0.01	−0.21	−0.16	−0.07	−0.03	0.09	0.26		
12. Chance attribution (2)	−0.14	−0.05	0.19	−0.09	0.06	−0.24	−0.06	0.07	0.01	0.22	0.17	
13. FM-specific attributions (8)	0.30†	0.13	0.35†	0.09	0.04	−0.26	0.10	0.07	0.42‡	0.54‡	0.21	0.28†

* Values are Pearson's correlation coefficients. Results are based on the revised Illness Perception Questionnaire in patients with fibromyalgia (IPQ-R-FM) that was administered.
† $P < 0.05$.
‡ $P < 0.01$.

traumatic event. Of the reported causes, 5% were not classifiable. Answers such as "I don't know what the cause is" or "the cause is my FM" illustrate this.

The quality of life of patients with FM was related to the number of consequences that patients experience (Table 5). Catastrophizing was significantly related to a low understanding of the symptoms of FM and positively related to the more cyclical nature of FM and an emotional representation. Fatigue was related to experiencing more consequences of FM and a low degree of personal control. Anxiety was related to experiencing more consequences of FM, to an emotional representation of FM, and to more psychological attributions and more FM-specific attributions. Feeling depressed was related to a low score for illness coherence, reflecting that these patients do not understand the

Table 5. Pearson's correlations between the IPQ-R-FM and quality of life, symptoms, the total FIQ score, and the total PCS score*

	FIQ component							
	Pain	Fatigue	Morning tiredness	Stiffness	Anxiety	Depressed	FIQ, total	PCS, total
Dimension								
1. Identity	0.10	0.23	0.35†	0.25	−0.03	0.09	0.31†	0.14
2. Timeline, acute/chronic	−0.23	−0.05	0.34†	0.30†	0.18	0.10	0.19	0.27
3. Consequences	0.28	0.37‡	0.18	0.25	0.45‡	0.28	0.62‡	0.16
4. Personal control	−0.02	−0.37‡	−0.13	−0.18	0.03	−0.11	−0.22	0.22
5. Treatment control	0.01	−0.18	−0.15	−0.15	−0.01	−0.06	−0.10	−0.20
6. Illness coherence	−0.20	−0.20	−0.08	−0.01	−0.32†	−0.36‡	−0.06	−0.42‡
7. Cyclical timeline	0.23	−0.03	0.07	−0.03	0.17	0.01	0.03	0.41‡
8. Emotional representation	0.09	0.16	0.15	0.03	0.48‡	0.45‡	0.30†	0.64‡
Attribution								
9. Psychological attribution	−0.09	0.17	0.04	−0.08	0.58‡	0.59‡	0.28†	0.20
10. Risk factor attribution	−0.07	−0.05	0.08	0.03	0.27	0.20	0.09	−0.05
11. Immune attribution	−0.19	0.13	0.20	0.09	−0.08	−0.01	−0.02	−0.20
12. Chance attribution	0.17	0.32†	0.02	0.04	−0.01	−0.08	0.10	0.01
13. FM-specific attributions	0.10	0.19	0.25	0.15	0.41‡	0.23	0.36†	0.15

* Values are Pearson's correlation coefficients. IPQ-R-FM = Revised Illness Perception Questionnaire in patients with fibromyalgia (FM); FIQ = Fibromyalgia Impact Questionnaire; PCS = Pain Catastrophizing Scale.
† $P = 0.05$.
‡ $P = 0.01$.

symptoms of their FM. Feeling depressed was also related to an emotional representation and more psychological attributions.

DISCUSSION

The purpose of this study was to explore the illness perceptions of patients with FM and to analyze the internal consistency, test–retest reliability, and intercorrelations of the IPQ-R-FM dimensions and attributions. Furthermore, the illness perceptions of patients were analyzed, and the relationship to quality of life and catastrophizing was examined.

Illness perceptions are related to the symptoms that patients experience. In this study, patients with FM experienced a mean of 7.6 symptoms. The symptoms that patients experienced most commonly were pain, fatigue, loss of strength, sleep difficulties, and stiff joints. Except for loss of strength, these symptoms were related to the diagnosis of FM. The same most common symptoms were described by Stuifbergen et al in a group of US patients with FM (20). Despite the fact that in their study 19 symptoms could be identified, the mean number of symptoms experienced was much higher than in our study (namely, 14). In both study groups, the duration of FM was >10 years; the main difference between the study populations was the fact that the US group was recruited from a waiting list before an intervention. We interpret this finding by stating that either patients with FM who seek medical care report more symptoms or that patients who experience more symptoms are seeking medical care, even after more than 10 years. Patients with FM experience more symptoms than patients with chronic pain (6.2 symptoms), those with acute pain (2.8 symptoms) (15), and those with rheumatoid arthritis (RA) (7.3 symptoms) but fewer symptoms than patients with chronic fatigue syndrome (9.3 symptoms) (25). The many symptoms experienced by patients underline the fact that FM is a serious health problem.

The outcome indicates that patients experienced their FM to be chronic and to have serious consequences. Patients experience little personal control and have low expectations of effective treatment. Compared with patients with RA (25), patients with FM attribute more symptoms to their FM, expect a more chronic course, experience fewer consequences of their FM, and experience FM as a less coherent condition. Compared with patients with chronic fatigue syndrome (25), patients with FM attribute fewer symptoms to their FM and consider the chronicity of the condition to be worse but its negative consequences to be fewer. Patients with FM report having less personal control and lower expectations of treatment than patients with chronic fatigue syndrome. US patients with FM experience more consequences due to their FM, are more positive about treatment opportunities, and have a more emotional representation (20).

Interclass correlations for dimensions and attributions were moderate to good, except for the item chance attribution. This is a dimension with 2 questions referring to FM caused by chance or accident. A relationship between these 2 questions was absent, just as described in the study by Moss-Morris et al, who reported an internal consistency of 0.23 for this chance attribution. The use of this dimension should be reconsidered. The test–retest reliability of the IPQ-R-FM in patients with FM is accurate (except for the identity scale [0.24]).

This low correlation on the identity scale reflects the change in symptoms experienced over time. The main symptoms, such as pain, fatigue, and loss of strength, were experienced by almost all patients at both time points (T1 and T2). The symptoms that changed over time were those experienced less often, such as stiff joints, sleep difficulties, upset stomach, headaches, and sore eyes.

Several significant interrelationships between dimensions were observed. Treatment control was strongly associated with personal control; this strong correlation (0.73) was also reported by Stuifbergen et al (20). During development of the IPQ-R, support was found for classifying personal control and treatment control as separate components, particularly the link between illness representation and treatment adherence. As discussed by Moss-Morris et al, this distinction may differ between illnesses. In patients with FM, the personal control and treatment control dimensions are strongly related. Probably, both personal control and treatment control in FM aim at self-efficacy to manage the symptoms, because no specific medical treatment is available.

Moss-Morris et al stated that researchers should modify the causal and identity scales in order to suit particular illnesses or adapt to cultural settings. We therefore added FM-specific attributions to the questionnaire. The FM-specific attributions were most frequently mentioned by patients (e.g., overused tendomuscular junctions and rheumatism); these attributions are important and should be elicited by clinicians when interviewing patients with FM. The FM-specific domain that we added contains somatic and psychological attributions. Future studies should focus on illness-specific

attributions and explore which ones can be added to the IPQ-R-FM.

In the last question of the IPQ-R-FM, patients are asked to describe, at most, 3 important causes for their FM. With this open-ended format, a wealth of personal information is obtained from the patients. Although this specific question is rarely described in studies of the IPQ-R, we believe this is relevant information. We chose a model to analyze this question, which could be relevant for clinicians when trying to understand the illness perceptions of patients with FM. The psychological versus somatic dichotomy is relevant for the interaction between patients and physicians. Internal versus external attribution is relevant for treatment motivation, although the relationship between illness perceptions and motivation is not yet clear (26).

In the medical literature, FM is often described as a medically unexplained syndrome or a functional somatic syndrome (27). The diagnosis is determined by exclusion of diseases such as RA, and the diagnosis is based on specific criteria defined by Wolfe et al (1). FM is "not popular" among physicians and medical students (28), and the physician–patient interaction is often considered to be difficult (29,30). The majority of the patients in this study reported a somatic, external source (e.g., muscular disease, vulnerability, overused tendomuscular junctions, or rheumatism) as the most important cause for their FM. This finding seems to contrast with what is known from the medical literature about the cause of FM. This contrast in attributions for the cause of FM could be part of the difficult physician–patient interaction. Physicians should anticipate that many patients will attribute their FM to a somatic cause and are searching for a treatment that fits this attribution. The IPQ-R-FM can be used in this process, or patients can be asked for their specific illness perceptions. Specific education or reattribution programs that focus on these inadequate cognitions have shown positive results on pain intensity, catastrophizing, and physical outcome in patients with low back pain (31) and in patients with FM (32). The benefits of exercise programs are enhanced when such programs are combined with self-management education (33).

Measuring the quality of a patient's life gives insight into the impact of FM on the patient's psychological, physical, and social functioning. Patients with FM have a significantly worse quality of life compared with healthy individuals and patients with RA (34). Patients experiencing more consequences of their FM report a worse quality of life. These patients see their FM as a serious condition with major consequences for their daily life, with many negative financial and social ramifications. Experiencing more consequences is also related to more fatigue. This underlines the fact that it is important for treatment programs to aim at improving these consequences.

Catastrophizing was found to be negatively related to illness coherence and positively related to a cyclical timeline and an emotional representation. An inability to understand the experienced symptoms probably increases the tendency to catastrophize. Experiencing FM as cyclical and feeling that symptoms are changing over time but are unpredictable also relate to catastrophizing as well as perceiving many emotional consequences and perceiving FM as a serious disease. Informing patients about their symptoms and trying to reassure them seems essential to break this vicious circle of catastrophizing. This education, however, should be part of a wider pain management approach.

The results of the present study support the IPQ-R-FM as a useful tool to assess illness perceptions in patients with FM. The outcomes on the IPQ-R dimensions reflect the expected pattern of patients with a long duration of FM. The interclass correlations, the test–retest reliability, and the interrelationships are sufficient. Modifications can be made by adding FM-specific causes and removing the chance attribution. Clinicians should assess illness perceptions in patients with FM in order to better understand perceived disability and to anticipate treatment strategies. Pretreatment illness perceptions and the changing of these beliefs are associated with better outcome and are therefore important in selecting patients for treatment programs (35). Dijkstra et al reported that patients with FM who describe fewer psychosocial causes and perceive fewer psychosocial influences in relation to their FM are less willing to adopt a self-management approach to coping with FM (36).

A weakness of this study was that patients were invited by means of an announcement on the Web site of a patient organization. From studies on patients with breast cancer, it is known that patients who participate in a support group have different illness beliefs: they report more active coping strategies and feel more control over their cancer than patients who do not participate in such groups (37,38). The manner in which this selection bias influenced the illness perceptions of patients with FM should be further investigated. The diagnosis of FM according to the criteria described by Wolf et al (1) was an inclusion criterion. These criteria are widely used by rheumatologists and general practitioners in The Netherlands. All patients experienced severe pain, stiffness,

and fatigue at the time of the study, but the patients who participated were not physically examined for the presence of the American College of Rheumatology 1990 criteria for the classification of FM (1). Comorbidities were not assessed in the study. The presence of comorbidities might influence the illness perceptions of patients with FM.

Classifying the causes according to the model (psychological versus somatic attribution, internal versus external attribution) that we adopted was sometimes difficult, for instance, in the case of sleeping problems (somatic or psychological) or stress (internal or external). Improved models could be used to better analyze these qualitative data. Future studies should analyze this model and test the relevance for clinicians. The sample size of the study was small, but given the purposes of this study, it is adequate.

Illness perceptions are relevant in patients with FM. The results of the present study form a basis on which to further investigate and implement illness perceptions in clinical practice.

AUTHOR CONTRIBUTIONS

Dr. van Wilgen had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

Study design. van Wilgen, van Ittersum.
Acquisition of data. van Wilgen, van Ittersum.
Analysis and interpretation of data. van Wilgen, Kaptein.
Manuscript preparation. van Wilgen, van Ittersum, Kaptein, van Wijhe.
Statistical analysis. van Wilgen.

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